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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,478	01/23/2004	James G. Deak	M4065.0490/P490-A	4941
24998	7590	12/15/2004	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			NHU, DAVID	
2101 L Street, NW			ART UNIT	
Washington, DC 20037			PAPER NUMBER	
			2818	

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/762,478

Applicant(s)

DEAK, JAMES G.

Examiner

David Nhu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 1/23/04.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-77 is/are pending in the application.
- 4a) Of the above claim(s) 1-38 and 68-72 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63-67 is/are allowed.
- 6) ☒ Claim(s) 39-51, 53-59, 62 and 73-77 is/are rejected.
- 7) ☒ Claim(s) 52, 60 and 61 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

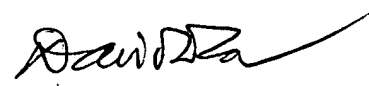
**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
  - 2) ☒ Certified copies of the priority documents have been received in Application No. 10/114,249.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 01.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTIONS

### Claims Objection

1. Claims 53, 75, "said antiferromagnetic exchange coupling is within the range of greater than 0 to  $\leq 300$  Oe between the first and second layers across said spacer layer" are not described/supported in the specifications.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 39-62, 73-77 are rejected under 35 U.S.C. 102 (b) as being anticipated by Parkin (5,764,567), and Chen et al (6,233,172 B1).

**Regarding to claims 39, 58, 73**, Parkin, (see figures 1A-1C, 2A, 7, col. 4, lines 1-67, col.6, lines 1-36), teaches a method for manufacturing a magnetic memory element comprising: forming a pinned or reference layer 18 with a magnetization in a first direction over a substrate 9; forming a tunnel barrier layer 20 over the pinned layer 18; and forming a sense layer 30 over the tunnel barrier layer, said sense layer having a first and second ferromagnetic layer separated by a spacer layer 31 and characteristic which results in stray filed coupling and anti-ferromagnetic exchange coupling between said first and second ferromagnetic layers (see figure 7).

Also, Chen, (see figures 1, 7, col. 7, lines 35-67, col. 7, lines 1-14), teaches forming a pinned or reference layer 23, 24 with a magnetization in a first direction over a substrate 12; forming a

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tunnel barrier layer 26 over the pinned layer 24; and forming a sense layer 28, 30 over the tunnel barrier layer, said sense layer having a first and second ferromagnetic layer 28, 30 separated by a spacer layer 16 and characteristic which results in stray field coupling and anti-ferromagnetic exchange coupling between said first and second ferromagnetic layers.

Regarding claims 40, 74, 59, Chen, (see figure 7), also teaches forming said first magnetization layer 28 over the tunnel barrier layer; forming a spacer layer 16 over the first magnetization layer; and forming the second magnetization layer 30 over the spacer layer.

Regarding claims 41-52, 54-57, 62, 76-77, Chen, (see col. 1-10), and Parkin, (see col. 1-14) also teach smoothing a surface of the pinned layer; the first and second magnetizable layers are formed of a material comprising NiFe, CoFe, Co, Ni, Fe, NiFeCo, Cu, Ru; the spacer is a conductor that is anti-ferromagnetic ...

### ***Allowable Subject Matter***

4. Claims 52, 60, 61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 63-67 are allowed.

### **Conclusion**

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Chen'172, Chen'286, Chen'926, Inomata'286 are cited as of interest.


6. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned (see 710.02 (b)).

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7. Any inquiry concerning this communication on earlier communications from the examiner should be directed to David Nhu, (571)272-1792. The examiner can normally be reached on Monday-Friday from 7:30 AM to 5:00 PM. The examiner's supervisor, David Nelms can be reached on (571)272-1787.

*The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.*

*Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.*

David Nhu 

December 11, 2004

